Amendments to the Specification and Abstract

In the Specification:

Before paragraph [0002] please insert the heading --BACKGROUND--.

Before paragraph [0010], please insert the heading --SUMMARY OF THE INVENTION--.

Please replace paragraph [0010] with the following rewritten paragraph:

[0010] It is ~~the~~ an object of the present invention to ~~propose~~ provide an optical device for combining a light beam and at least one further light beam which can be used flexibly, in particular for different wavelengths, and which at the same time allows efficient and effective monitoring of the combining of light beams.

Please replace paragraph [0011] with the following rewritten paragraph:

[0011] ~~This objective is achieved by~~ The present invention provides an optical device ~~which~~ that features a means for splitting a first reference beam from the light beam and a further first reference beam from the further light beam, as well as a further means for splitting a second reference beam from the light beam and a further second reference beam from the further light beam; the reference beams being detectable by a position detector, and the propagation direction and/or the position of the light beam and/or of the further light beam being adjustable as a function of the detected positions.

Please replace paragraph [0017] with the following rewritten paragraph:

[0017] In one particular embodiment, the propagation direction and/or the position of the light beam or beams can be changed by control elements, which can, for example, take the form of gimbal-mounted tilting mirrors. In a ~~particularly~~ preferred variant, it is proposed that the angles of incidence and/or the locations at which the light beams strike the first interface be adjustable.

Control elements are provided for this purpose as well. Possible control elements include all adjustable and preferably controllable light beam deflecting elements, for example, also acousto-optical deflectors (AOD). The control elements are preferably placed upstream of the means for splitting off a first reference beam.

Please replace paragraph [0018] with the following rewritten paragraph:

[0018] ~~Particularly advantageous~~ Advantageous is an embodiment in which the control elements can be driven in open and/or closed loop as a function of the positions detected by the position detector(s). Such a design allows implementation of a closed-loop or open-loop control which automatically optimizes the alignment of the light beam (light beams) and the collinearity of the combined light beams.

Before paragraph [0028], please insert the heading --BRIEF DESCRIPTION OF THE DRAWINGS--.

Please replace paragraph [0028] with the following rewritten paragraph:

[0024] The subject matter of the present invention is schematically represented in the ~~drawing~~ drawings and is described below with reference thereto. ~~to the Figures, in which~~ In the drawings, equally acting components are denoted by the same reference numerals. Specifically,

Before paragraph [0033], please insert the heading --DETAILED DESCRIPTION--.

Please replace paragraph [0037] with the following rewritten paragraph:

[0037] The position detector 27 generates position signals and transmits them to a processing unit 51. Based on the position data received, processing ~~work~~ unit 51 drives control elements 13, 17 until the light beams 3, 5 exiting the second plane-parallel plate are in the desired position and propagate in the desired direction. The current position and propagation direction of light beams 3, 5 are permanently or regularly compared to the desired position and propagation direction and,

if necessary, automatically corrected by processing unit 51 via control elements 13, 17.

Please replace paragraph [0039] with the following rewritten paragraph:

[0039] After passing through illuminating pinhole 65, light beams 3, 5 are directed by a beam splitter 67 to a gimbal-mounted scanning mirror 69 which guides light beams 3, 5 through scanning optical system 71, tube optical system 73 and objective 75, and over or through sample 77. Sample 77 is labeled with several fluorescent dyes. The detection light beam 79 emanating from sample 77 passes through objective 75, tube optical system 73, and scanning optical system 71, and reaches beam splitter 67 via scanning mirror 69, and, after passing through detection pinhole 81, it strikes a detector 83 which designed as a multiband detector and generates electrical detection signals which are proportional to the power of detection light beam 79. These signals are transmitted to PC 85. The detection signals are processed in PC 85 and displayed to the user on a monitor 87 as an image of sample 77. The scanning microscope is insensitive to misalignments and allows quick and easy replacement of the light source or the optical fiber.

Please replace paragraph [0040] with the following rewritten paragraph:

[0040] Figure 4 shows a device for aligning a light beam 3 to a nominal optical path, which is illustrated in the drawing as a nominal optical axis 89. Light beam 3 strikes a first control element 13 including a first titling mirror 15 which can be tilted in two axes. Subsequently, first light beam 3 strikes a second control element 17 including a second titling mirror 19 which can be tilted in two axes. Second control element 17 directs first light beam 3 to a means for splitting off a first reference beam 25, the means being designed as a first interface 21 of a prism 23. At first interface 21, a first reference beam 25 is split off by partial reflection and strikes position detector 27, which is designed as a CCD array 29. After passing through first interface 21, first light beam 3 passes through prism 23 and strikes a further means for splitting off a second reference beam 33, the further means being designed as a second interface 31. At second interface 31, a second reference beam 33 is split off by partial reflection and, after total internal reflection at a third interface 35 and passage through first interface 21, it strikes position detector

27. Located in front of the position detector is a lens 49, which focuses the reference beams onto CCD array 29. It is also possible to provide for a slight defocus in order to achieve a better resolution by interpolation across several pixels. From the various points of incidence of the reference beams on CCD array 29 it is possible to infer the locations and angles at which light beam 3 strikes first interface 21 and second interface 31, and thus the position and propagation direction of light beam 3 after exiting prism 23. The position detector generates position signals and transmits them to a processing unit 51. Based on the position data received, processing unit 51 drives control elements 13, 17 until the light beam [[5]] 3 exiting the prism propagates along the nominal optical path, i.e. along nominal axis 89.

Please replace paragraph [0043] with the following rewritten paragraph:

[0043] 1 optical device
3 first light beam
5 second light beam
7 light source
9 first laser
11 second laser
13 first control element
15 first tilting mirror
17 second control element
19 second tilting mirror
21 first interface
23 prisms
25 first reference beam
27 position detector
29 CCD array
31 second interface
33 second reference beam

35 third interface

37 third control element

39 third tilting mirror

41 fourth control element

43 fourth tilting mirror

45 further first reference beam

47 further second reference beam

49 lens

51 processing ~~work~~ unit

53 AOTF

55 first plane-parallel plate

57 second plane-parallel plate

59 optical system

61 optical fiber

63 further optical system

65 illuminating pinhole

67 beam splitter

69 scanning mirror

71 scanning optical system

73 tube optical system

75 objective

77 sample

79 detection light beam

81 detection pinhole

83 detector

85 PC

87 monitor

89 nominal axis